

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

THIS PAGE BLANK (USPTO)

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
12 September 2002 (12.09.2002)

PCT

(10) International Publication Number
WO 02/070543 A3

(51) International Patent Classification⁷: **C07C 69/76**

(21) International Application Number: **PCT/US02/07143**

(22) International Filing Date: **7 March 2002 (07.03.2002)**

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data:
60/273,998 **7 March 2001 (07.03.2001)** **US**

(71) Applicant (*for all designated States except US*): **UNIVERSITY OF TEXAS SYSTEM** [US/US]; 201 West 7th Street, Austin, TX 78701-2981 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report*

(88) Date of publication of the international search report:
16 October 2003

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **NORLING, Barry, K.** [US/US]; 13427 Shorecliff Street, San Antonio, TX 78248 (US). **NERRA, Satsangi** [IN/US]; 128236 Hunting Bear, San Antonio, TX 78249 (US).

(74) Agent: **MORRIS, Paula, D.**; Paula D. Morris & Associates, P.C., 2925 Briarpark Drive, Suite 930, Houston, TX 77042 (US).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **ULTRA-LOW SHRINKAGE COMPOSITE RESINS BASED ON BLENDED NEMATIC LIQUID CRYSTAL MONOMERS**

(57) Abstract: A novel method of making liquid crystal monomers, novel monomer blends, and novel secondary monomers for use

VO 02/070543 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/07143

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C07C 69/76

US CL : 560/066, 73

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 560/066, 73

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
STN CAS file registry STRUCTURE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 869 112 A1 (DAIMLER-BENZ AKTIENGESSELLSCHAFT) 17 MARCH 1998 page 18, figure 4, reaction (1) page 22, figure 8b.	1-4, 84, 85 18-22, 61-70
X	EP 0 242 278 A2 (BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS) 21 OCTOBER 1987 entire reference especially page 7.	97-105, 115

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"B" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

10 February 2003 (10.02.2003)

Date of mailing of the international search report

04 JUN 2003

Name and mailing address of the ISA/US

Commissioner of Patents and Trademarks

Box PCT

Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

Paul T. Killos

Telephone No. 703-308-1235